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Effect of Vitamin (C) Doses Accompanying the Increased Intensity Training on the Concentration of Protein (Bak & Bclxl) for Football Players

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Abstract: The study aimed to identify the doses of vitamin (C) associated with increased intensity training and their effect on measurements of the level of protein (Bak & BclXL), free radicals (MDA) and enzyme (CAT) in football players. The experimental method was used for its suitability and the nature of the phenomenon to be studied and represents the research community and they are players Maysan Sports Club Applicants over the age of (20) years, and the study came out with the following conclusions The increased intensity exercises significantly affected the decrease in the level of protein (BclXL) and the control group was characterized by a decrease from the experimental group; The experimental group about the control group. One of the most important recommendations is to conduct periodic examinations to confirm the health status of athletes, the need to adopt a nutritional program accompanying the training programs and the combination of them to improve the training status.

Keywords: Vitamin (C) Doses Associated with Increased Intensity Workouts, Protein Bak & BclXL.

1.1 INTRODUCTION

The development of sports performance requires many factors, including proper planning of training loads, to bring about a number of biological changes in order to develop the functional aspect and its physical and skill returns, and often resorting to training with increasing intensity during training circuits aimed at stimulating the vital body systems and work mechanisms at their higher levels to make positive adaptations, and successively repeating training circles for a relatively long time in light of the imbalance of external load and food quality, will lead to the emergence of the accumulation of stress effects Internal load, which causes physiological stress, is a challenge to the body's potential, including immune system responses.

The immune system responses associated with physical exertion and their positive and negative effects are topics of great importance as they are concerned with the health aspect of the body, as the immune responses vary according to the type and intensity of the exercises performed, and when their intensity increases, someside effects appear through the formation of free radicals, which increase as an imperative necessity for training loads, Thus, they contribute to the events of oxidative stress of cells, which weakens the activity of proteins and their expressive function of regulating the work of genes most likely, as a result of the decline in enzymatic antioxidants to ward off the risk of free radicals, which indicates an increase in indicators of fat damage, proteins and DNA, and this depends mainly on the intensity and intensity of exercise, environmental conditions and type of nutrition, which affects the components of the cell and its damage, and in this regard the levels of programmed cellular death rise.

From the foregoing, the importance of our study in shedding light on the immune system responses represented by programmed cellular death resulting from increased intensity and nutritionally supported training, in order to ensure a healthy level to maintain a homogeneous indoor environment, it is difficult for sport to reap its fruits without instilling health in the bodies of players and raising their optimal level of achievement.

1.2 Research Problem:

During the implementation of training doses, football players are exposed to training of increasing intensity, which may not correspond to their physiological state, which exposes them to increasing functional requirements, which mislead the functions of the body systems, and given the lack of information available to us or its lack of modernity, which ultimately serves to raise the level of achievement, so we decided to delve into this phenomenon by answering the following question:

- What is the level of changes that can occur in the internal environment of muscle cells in terms of programmed cell death and some biological variables due to the effect of carrying more intense exercises supported by dietary doses of vitamin (C) to identify some facts that are not available.

1.3 Research Objectives:

1- Identify the doses of vitamin C associated with increased intensity training and their effect on

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measuring the level of protein (Bak & BclXL) in football players.
2- Identify the doses of vitamin C associated with increased intensity training and their effect on measuring the level of concentrations of free radicals (MDA) and enzyme (CAT) in football players.

1.4 Research Hypotheses:
1- Vitamin C doses associated with increased intensity exercise affect the measurement of the level of protein (Bak & BclXL) among the research sample.
2- Vitamin C doses associated with increased intensity exercise affect the measurement of the level of concentrations of free radicals (MDA) and enzyme (CAT) in the research sample.

2- RESEARCH METHODOLOGY AND FIELD PROCEDURES:

2.1 Research Methodology:
The researchers adopted the experimental approach for its suitability and the nature of the phenomenon to be studied.

2.2 Research Community:
The researchers determined their research community in a deliberate way, namely the players of Maysan Sports Club in Maysan Governorate, the category of applicants over the age of (20) years, and registered with the lists of the Football Sub-Federation for the sports season (2021-2022), which numbered (26) players.

In order to obtain a sample characterized by accurate scientific specifications needed by the researchers in the implementation of their research procedures, they subjected the research community to clinical examination, and conducted some analyzes by a specialist doctor at Al-Sadr General Hospital, to ensure that the players are free of any health problems that may affect the results of the study, as the researchers took Taking into account the homogeneity element of the sample members for the following variables (height- body mass- chronological age- training age) as well as the equivalence of the study variables, which include protein (Bak & BclXL), free radicals (MDA) and enzyme (CAT), and it was found that there is clear homogeneity and equivalence in these variables.

2.3 Tools, Devices and Means Used in Research:
(Tests measurement, foreign references and sources, medical balanceCut).

3.4 Blood Drawing Procedures:
In order to conduct tests for the variables of the biological process of the study, (5 ml) of venous blood was withdrawn by a specialized staff in the laboratory of the Faculty of Science for the members of the research sample at rest time by disposable (5 ml) medical syringes, and the blood was placed in special tubes to prevent clotting, after which it was separated by a centrifuge to obtain plasma so that it can be analyzed by special kits prepared to measure the levels of protein level (Bak & BclXL) and concentrations of free radicals (MDA) and enzyme (CAT).

3.5 Field Procedures for Research:
After obtaining all the original approvals from Maysan Sports Club and the members of the research sample knew the importance of the study and the extent of benefit from it, they expressed their consent to cooperate with the researchers and implement their research procedures, and after completing all preliminary procedures, starting with the results of the clinical examination and laboratory analysis, which resulted in the safety of the sample and their full health, the researchers proceeded By conducting the aforementioned blood draw with the players' commitment to health prevention measures in light of the Corona pandemic, according to the directives of the Supreme Committee for National Health and Safety, at exactly ten o'clock in the morning on Sunday, 30/1/2022, in which the players were subjected to doses of training loads of increasing intensity of the curriculum prepared and followed by the coach, and This was accompanied by giving doses of vitamin C in the amount of (500 milligrams) according to the recommendations of the World Health Organization (WHO) as well as the US Food and Drug Administration (FDA), before the implementation of each dose of the increasing intensity training doses of (36), After a period of (12) weeks, the second blood draw was performed at exactly ten o'clock in the morning on Sunday, 17/4/2022.

3-6 Statistical Treatments: The researchers used the statistical bag (SPSS) version (23).

3- PRESENTATION AND DISCUSSION OF RESULTS:

3-1 Presentation of Results Measurements (MDA & CAT & Bak & BclXL):

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Table (1): shows the arithmetic means, standard deviations, calculated (T) value, significance level and significance of the differences in the measurements of (MDA & CAT & Bak & BclXL) (pre-post) for the control and experimental groups

Statistical Treatments		Unit of measurement	Going to	±	Calculated value (T)	Sig	Significant differences
Free Radicals (MDA)							
Officer	southern	mg/dl	0.58	0.11	4.06	0.002	0.01
	Go away		0.67	0.12			
Experimental	southern		0.59	0.14	2.42	0.033	0.05
	Go away		0.48	0.12			
Enzyme (CAT)							
Officer	southern	ng/ml	5.72	0.35	2.54	0.032	0.05
	Go away		5.97	0.28			
Experimental	southern		5.61	0.24	8.43	0.000	0.01
	Go away		6.53	0.22			
Protein (BclXL)							
Officer	southern	ng/ml	7.39	0.49	11.98	0.007	0.01
	Go away		5.69	0.32			
Experimental	southern		7.36	0.49	7.37		0.01
	Go away		6.17	0.46			
Protein (Bak)							
Officer	southern	ng/ml	6.73	0.22	5.74	0.000	0.01
	Go away		7.48	0.44			
Experimental	**southern**		6.74	0.20	2.30	0.041	0.05
	Go away		6.95	0.27			

Table (2): shows the arithmetic means, standard deviations, calculated T value, significance level, and significance of the differences in the dimensional measurements of (MDA & CAT & Bak & BclXL) for the control and experimental groups

Statistical Treatments	Unit of measurement	Going to	±	Calculated value (T)	Sig	Significant differences
Free Radicals (MDA)						
Officer	mg/dl	0.67	0.12	4.06	0.002	0.01
Experimental		0.48	0.12			
Enzyme (CAT)						
Officer	ng/ml	5.72	0.35	6.72	0.000	0.01
Experimental		6.53	0.22			
Protein (BclXL)						
Officer	ng/ml	5.69	0.32	2.95	0.007	0.01
Experimental		6.17	0.46			
Protein (Bak)						
southern	ng/ml	7.48	0.44	3.46	0.002	0.01
Go away		6.95	0.27			

3.2.1 Discussion of the Results of Free Radicals (MDA):

The researchers attribute this to the fact that the high concentrations of (MDA) are due to the nature of the load of the exercises of increasing intensity practice, which constituted exceptional physical burdens on the various organs of the individual led to the acquisition of large amounts of oxygen to compensate for the decrease in the transformation processes of the compound (ATP) and the resulting formation (MDA), which is a normal function of cellular respiration but can impair the normal functioning of cells if present in high quantities leading to high concentrations of free radicals. This explanation is logical and consistent with all previous studies, which confirmed this, "When performing a training load, the muscles need more energy than they need at rest, and this is accompanied by the emergence of free radicals." (Aluir, 2014) (Boroujerdi, 2011) and

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also "During the pumping of oxygen into muscle cells, MDA production increases and this indicates electron leakage and damage to the electron transport chain which ultimately reduces the release of ATP". (Brigelius-Flohe, 2013) (B. Liu, 2008) (Belikova, 2006)

The researchers believe that other reasons that lead to high free radicals are causes related to the dynamics of blood during and after the performance of physical load and the rapid blood flow to the organs from which it came to rehydrate the working and corresponding muscle cells, which is accompanied by the emergence and formation of these roots as an inevitable result, according to most of the literature and previous studies that confirmed that, "The perfusion processes of the muscles working with blood lead to the formation of free radicals." (Little JP, 2010) (Psilander N, 2010) and "After performing a high-intensity anaerobic effort, an increase in the activity of reactive oxygen species occurs in skeletal muscles". (Luchetti, 2010) (Garley, 2010) as well as "free radical activity increases after training muscles with high effort". (Tauler P, 2006) (Sollberger, 2009)

The researchers also believe that one of the causes of the formation of free radicals and their high proportions is due to the nature of the performance of the loads of exercises increasing the intensity of the implementation of physical efforts and their urgent and increasing need for energy to implement them and be sufficient to accumulate metabolic residues in the muscles that work to create a suitable environment for the formation of those roots, which constitutes another burden added to the burden of mechanical pressure on the muscle fibers to be causes that work to damage some of them, This explanation is logically consistent with all previous studies, which confirmed this, "The high metabolic waste that accompanies high-intensity loads leads to damage to some muscle cells and the leakage of freeradical-stimulating factors." (Ji LL, 2008) and "Free radicals are strongly related to the type of training, the greater the intensity and volume of training, the greater the free radicals." (Vollaard NB, 2005) and "(MDA) arises during anaerobic physical exercise through metabolic processes associated with re-complex (ATP) and is in the inner membrane of the mitochondria". (He, F, 2016) (Morales-Alamo, 2014)

3.2.2 Discussion of the Results of the Enzyme (CAT):

The researchers believe that the importance of delving into this variable as an antioxidant and enhances the defense systems of cells because it is a positive indicator and its activity is related to the type of food rich in these antibiotics, which will contribute to increasing the activity of mitochondria to provide muscle cells with energy and maintain them and restrain free radicals, and this explanation came in line with all previous studies "Some foodstuffs contain multiple phenolic compounds, which are electron-donating antioxidants that interact with free radicals and thus prevent their harmful effect on cells and tissues in skeletal muscles." (Bloomer, 2005) that "an effective antioxidant is vitamin C, which works to remove free radicals that are increased by exercise." (Jenkins RR, 2000)

The researchers attribute this to the low concentrations of antioxidants (CATs), which work in breaking the role of free radicals and warding off their danger to reduce the lethality of tissues and cells, and this depends on the nature of the nutrients contained in antioxidants, which contribute to providing an appropriate internal environment that contributes to the optimal performance of the athlete, and this explanation is logical and consistent with all previous studies "that anaerobic exercise negatively affects the state of cellular oxidation by causing oxidative stress at the level of free radicals and this It depends on the intensity of the exercise." (Inal M, 2001) (ACSM, 2009) and "that the best defense against oxidative processes within the body that occur as a result of the breakdown of molecules is to prevent these harmful effects of free radicals by antioxidants that are a weapon in ending their effectiveness." (Ognovszky H, 2005)

The researchers explain that the electron transport chain to release energy in the mitochondria is the main source of the emergence of reactive oxygen types during physical load and thus increases the indicators of free radicals, "The release of reactive oxygen types through the electron transport chain converts the energy needed in the implementation of physical exertion." (Dalle-Donne, 2006) posing a serious threat to the defense system of the enzyme (CAT) and thus causing damage to tissues and cells as a result of oxidative damage to the active role of free radicals, and this explanation is consistent with all previous studies "The low level of the enzyme (CAT) is an important antioxidant in the human body that enhances enzymatic defense systems and increases the activity of free radicals." Also, "free radical activity increases in

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athletes undergoing an increasingly intense training load program due to decreased CAT activity." (Vibha, 2011)

It is useful to mention here that the decay of antioxidants and their effective role and lack of supply through rich substances in the control group compared to the experimental group that carried them resulted in the emergence of free radicals during the load of increased intensity exercises.

3.2.3 Discussion of BclXL Protein Results:

It is clearly evident the low level of protein concentrations (BclXL) as a result of the doses of training increasing intensity carried out in varying proportions between the control and experimental groups and this is what resulted from the statistical treatments for those measurements, which gave an impression of the role of protein and the phenomenon to be studied (programmed cellular death) and explained by the researchers to the inevitable need and increasing demand for energy, which led to an increase in the concentration of its residues Metabolism is represented by free radicals during and after pregnancy, which hinders or inhibits the work of cells and increases their burden and ultimately exposes them to exacerbated oxidative stress and causes their desperation, and this was consistent with all previous studies: "The levels of apoptosis in the blood rise after training pregnancy due to the polarization of the mitochondrial membrane as a result of exposure to oxidative stress and free radicals and a significant decrease in the protein BclXL in the blood." (Madsen-Bouterse SA, 2006) (Rocha-Rodrigues, 2018) and that "protein activity (BclXL) maintains the integrity of the mitochondrial membrane from apoptosis". (Peterson JM, 2008) (Favaloro B, 2012) "low level of BclXL anti-apoptosis protein begins after 8 weeks of training pregnancy." (Baek SS, 2016) (Baek SS, 2011)

It is clear in the above explanation that a steady significant decrease in the levels of protein (BclXL), which contributes to providing a suitable environment within the cells for the control group compared to the experimental slightly decreased, and this is a definitive indication that the phenomenon of the study is clearly and significantly affected by the increasing intensity exercises, and this explanation is identical with all previous studies that dealt with the phenomenon of (apoptosis) where it refers to "Regular exercise can increase muscle apoptosis and this is contingent on a decrease in BclXL." (Vescovo G, 2000) and "High training efforts lead to frequent high loads in athletes that cause damage to cell proteins and death." (Bernstein D, 2003)

In the level of BclXL protein levels before the increased intensity exercise, these levels showed no apparent difference that could be recorded as exceptional between the control and experimental groups.

3.2.4 Discussion of the Results of the Protein (BAK):

It is known that the processes of energy conversion need a homogeneous environment that results in the fission of adenosine triphosphate, the higher the exercises of increasing intensity, the greater the process of transformation of the compound (ATP) that the body needs in successive muscle contractions, which cannot occur unless metabolic processes increase in return and due to the release of energy, its residues increase steadily, causing damage to cells as a result of oxidative damage to the role of active free radicals and thus the cell death index rises, This explanation is logical and consistent with all previous studies "during intense exercise and endurance promotes muscle glucose depletion and thus demonstrates autophagy of damaged cells." (Alway SE, 2005) also "the permeability of the outer membrane increases when apoptosis is induced and the protein (BAK) undergoes a cumulative change on the cell wall to allow the passage of the Caspase-9 protein through the mitochondrial membrane." (Chabi B, 2009)

The researchers believe that the imbalance and instability of the internal environment of the cells within their normal limits after increasing intensity training led to a rise in metabolic processes accompanied by a decrease in the protein (BclXL), which allowed an increase in the concentrations of protein (Bak) on the surface of the outer shell of the mitochondria and work to release (Cytochrome-C) to its outer shell, whose activity is related to the role of oxidative stress. This explanation is logical and consistent with all previous studies: "Bak levels rise relative to BclXL by changing the intensity of exercise that generates elevated apoptosis in muscle." (Jafari A., 2015) states that "intense exercise activates apoptosis factors specifically the BAK protein) and due to extreme stress the cells cannot remove disturbed proteins and therefore there is no return from the stimulation of the apoptosis mechanism." (Wang, 2018) and also "that exercising for periods of time at high intensity leads to weakening of the mitochondrial system due to an increase in BK

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levels above BclXL, indicating an increase in the signal of apoptosis." (He C, 2012)

4. CONCLUSIONS AND RECOMMENDATIONS:

4.1 CONCLUSIONS

1- Programmed cellular death tests and biological variables were not recorded critically and all their results were within the normal limits of the variables in the members of the research sample.

2 -The impact of the exercises increasing intensity significantly in the decrease in the level of protein (BclXL) and the control group was characterized by a decrease from the experimental group among the members of the research sample.

3- Increased intensity exercises significantly affected the high levels of protein (BAK) and distinguished in that experimental group from the control group among the members of the research sample.

4- The tests recorded an increase in free radical levels, as the control group was distinguished in a higher (MDA) than the experimental group due to the increased intensity exercise.

4- The tests recorded a significant decrease in the level of antioxidants, and the control group was characterized by the contrast to the experimental group, an increase in theenzyme (CAT) due to increased intensity training.

4.2 RECOMMENDATIONS

1- Adopting the results reached as a criterion to regulate the level of training status of athletes.

2- Conducting periodic examinations to confirm the health status of athletes.

3- The need to infer indicators of cell death programmed according to the level of free radicals and antioxidants to avoid any possible damage to the training process of athletes.

4- The need to adopt a nutritional program to accompanythe training programs and mix them to improve the training status.

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